From 1986, PLANNING FOR 1987

Seattle City Light
R&D Project Goals

Form 1

Project Title: Focused PCB/Hazardous Waste Treatment Demonstrations

I.D. Number:

Date Started: February 1987

Expected Completion Date: January 1989

Sign-offs
Date: April 2, 1986
Org. Unit: 120
Project Manager: T. Kakida
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Phone: 625-3956
(Proj. Manager)

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1. Statement of Project Goals: Emerging technologies which are aimed at reducing the volume of PCB wastes handled and disposed by City Light will be examined by the proposed projects:

   a) Soil washing (extraction) of soils contaminated by PCBs and other hazardous wastes;

   b) Microbial degradation of PCBs in contaminated soils;

To BE Done 1986

~~c) rinsing of transformers prior to disposal.~~

The effectiveness and applicability of various methods will be tested in each project. These studies will result in processes which can be incorporated into existing City Light operations.

Major benefits to the Utility will include:

- improved ability to comply with federal and state laws mandating certifiable waste reduction programs (Resource Conservation and Recovery Act, Section 3004, for example),
- improved management of hazardous wastes generated by City Light, including long-term cost-savings, and
- substantial reduction in liability exposure to City Light due to effective decontamination or destruction of hazardous wastes.

City Light has found that compliance and response to environmental laws governing hazardous substances can be technically complex and expensive. In spite of Utility efforts to act responsibly, liability for hazardous wastes may continue indefinitely with current practices, because contaminants are simply transferred from one site to another (usually a landfill).

Small amounts of PCB-contaminated materials (soil and oil) have been shipped to interested vendors to test treatment processes, with encouraging results. City Light has done this in an attempt to seek solutions to unique contamination problems (Strandley/Manning site, Lake Union Steam

Plant). Typical responses to these problems have not been applicable, effective, or desirable to City Light and the U.S. Environmental Protection Agency (EPA). Therefore, alternative technologies must be tested further under conditions which more closely simulate the Seattle environment. Such testing will allow the utility to better evaluate the technical and economic feasibility of each project.

These projects will continue the preliminary efforts conducted in 1986 R&D projects. For at least one project (transformer rinsing) a determination will be made on feasibility at the end of 1987, allowing the results to be incorporated into budget and CIP processes for 1989. The other projects (soil washing, microbial decontamination) will expand into site-specific demonstrations in 1988, generating the needed data for regulatory (EPA) review and approval processes. Engineering and other design, construction and operation considerations can be identified and developed during the demonstration phase.

City Light's PCB management program has been discussed by the utility community (we have presented several papers at meetings and expect to publish at least one article in 1986); the continued efforts to develop our program through R&D initiatives will maintain City Light's leadership role in environmental and hazardous waste management.

These projects are consistent with the City Light framework for the 1987 R&D program because they explore "new and innovative projects" which will test the "...feasibility of emerging technologies..." and their applicability to City Light situations. The demonstrations will generate needed data for the Utility and environmental communities through a focused, problem-solving approach to PCB management, and their results may reduce the scope of liability and risk associated with handling and disposal of these substances.

Project Title: I.D.#

II. Methodology

1. Who?

All projects will be managed by the Environmental Affairs Division (EAD). Consultants will conduct the research and coordinate efforts between laboratories and other subcontractors. Coordination and technical support may also involve Seattle City Light Engineering, Operations, and Materials Management Divisions. Consultation with the Law Department may occur (permit applications, contractual issues, etc.). Consultant deliverables will include literature reviews, protocol development, interpretation of results (including quality control), and recommendations concerning feasibility, implementation, and further research.

2. What?

A. Soil Washing. Initial research to review the literature and data from the 1986 R&D project on concrete washing will select potential processes for pilot studies. PCB-contaminated soil samples from City Light substations and/or scrap metal dealer sites will be made available for testing (probably two to five tests). Results of these pilot tests will be documented in a report and evaluated for potential further testing at a local site.

EAD Staff will spend 25 hours in the first quarter developing an RFP and selecting a consultant. 25 hours in each of the remaining 3 quarters will be spent monitoring the contract in 1987. If initial test results warrant further study, a local site will be selected and EAD will spend 30 hours each quarter in 1988 coordinating a local demonstration study.

B. Microbial Decontamination. Based on 1986 R&D gradings, soil samples with known PCB levels will be shipped to interested vendors, along with appropriate controls. Soil types will be characterized in order to compare and match specific microbial species (or populations) most suited for these soil types and contamination levels. PCB decontamination rates will be monitored and analyzed, and conditions to enhance decontamination rates and efficacy will be studied. Microbial population dynamics will also be studied (nutritional needs, population densities, growth dynamics).

If results prove successful, a Seattle City Light demonstration site will be explored for possible in situ

experiments. Regulatory permit applications, safety, and environmental sampling plans will be developed for this demonstration. In 1987, approximately 40 hours will be utilized in the 1st quarter, and approximately 30 hours in each of the next 3 quarters. In 1988, if an in situ project is pursued EAD staff will spend 50 hours each quarter to coordinate the demonstration.

C. Transformer Rinsing. Existing processes to rinse and decontaminate transformers will be reviewed and evaluated. Specific equipment types, with known PCB levels, will be identified and chosen for testing. Protocols for testing, including solvent type(s), rinsing and sampling procedures, spill prevention designs, and storage/disposal measures will be established. Rinsing experiments, analysis of data, and evaluation of rinsing results will be performed. In addition to evaluation of technical feasibility, an economic impact analysis will also be prepared, involving an evaluation of materials required, staff and labor hours, O & M requirements, effects on liability exposure to City Light, and comparison with current transformer processing and disposal practices.

Sampling of solvents, rinsates and equipment, and laboratory analysis of these samples, will be required for this project. A preliminary determination of sampling design and apropriate sample size will occur at the beginning of the project, based on types of equipment tested and required quality control procedures. Staff time will involve approximately 80 hours in the 1st and 2nd quarters of 1987; 60 hours in the 3rd quarter, and 40 hours in the fourth quarter.

3. Where?

A. Soil Washing. The pilot tests will be done at existing pilot facilities. The literature review will determine where these experimental plants are located and which ones are recommended. Currently we know of one in Ohio. If a local test is conducted in 1988, it will be most likely conducted in a City Light substation. The 1987 report will make recommendations for the best site for an on-site demonstration.

B. Microbial Decontamination. Soils will be collected and shipped from Seattle City Light facilities (including Strandley/Manning site). Studies will initially be conducted at laboratories or other facilities managed for these kinds of experiments. Siting for an SCL site could commence at the end of 1987.

C. Transformer Rinsing. Rinsing and sampling activities will occur at the South Service Center. Analytical work will be conducted at laboratories. Data evaluations and interpretation will be conducted by City Light staff and consultants.

4. When?

A. Soil Washing. Consultant selection will be done by the 1st quarter '87. Literature review and pilot studies will occur through 1987. If this is successful, continuing research at a local demonstration site will go through 1988.

B. Microbial Decontamination. Consultant selection and identification of interested and qualified testing sites will be completed by March, 1987. Shipping of samples and commencement of experiments will start in the second quarter, with full-scale trials in progress by the beginning of the 3rd quarter. Monthly progress reports will summarize tasks completed, problems, and direction of research. A report completed by December, 1987 will compile and summarize activities. The monthly reports will be used to determine whether siting activities for an SCL on-site trial can commence. Regulatory requirements for each review, permit applications and other approvals will largely control the progress of siting activities and commencement of in situ experiments (likely to commence in 1988) following the same methodologies utilized in pilot trials, the in situ work should be substantially completed in December, 1988, with a final report (and possibly EPA review) completed in the 1st quarter, 1989.

C. Transformer Rinsing. Consultant selection and experimental design will occur during April, 1987. Rinsing activities and sampling analysis will be performed thorugh June, 1987 with a draft report describing technical merits of this project to be completed by July, 1987. Investigations into the economic feasibility, prospects for integration into City Light operational activities, and development of final recommendations, costs, and schedule for implementation will be completed by October, 1987, with a final report to be delivered in December, 1987. This information should be available for initial implementation in 1988, and integration into 1989 workload forecast and CIP planning process.

5. How Funded?

A. Soil Washing. Studies will be funded through Seattle City Light R&D funds in 1987; R&D and matching funds will be sought for 1988 on-site demonstration.

B. Microbial Decontamination. Pilot studies will be funded through Seattle City Light R&D. R&D and other sources for in situ experiments will be sought in 1988.

C. Transformer Rinsing. Research into feasibility and methods will be supported by R&D funds in 1987. Development and integration (post 1987) should be supported by incorporation into CIP and other budget processes.

Form 3

Seattle City Light
R&D Project Milestones

Project Title: I.D.#

III. Project Milestones/Consultant Deliverables	Expected Completion Date	Revised Expected Completion Date	Completion Date
1. Milestones (1987-1988)			
Consultant selection	April 1987		
~~Transformer rinsing experiments completed~~	July 1987		
Soil decontamination pilot studies commence	August 1987		
~~Transformer rinsing final report submission~~	Dec. 1987		
Soil decontamination final report submission	Dec. 1987		
Identify site for local demonstration projects and initiate permit (E.P.A.) process	January '88		
Begin local demonstration for soil washing and microbial decontamination studies	April 1988		
Final report on soil decontamination demonstration projects	Dec. 1988		
2. Consultant Deliverables			
~~Experimental design for transformer rinsing~~	May 1987		
Literature review and pilot test recommendation for soil washing and microbial decontamination	July 1987		
~~Technical results reported for transformer rinsing~~	August 1987		
~~Final report evaluating transformer rinsing experiment, including feasibility and cost study~~	Dec. 1987		
Final report and evaluation of soil washing and microbial decontamination pilot tests, with recommendations for local demonstration studies	Dec. 1987		
Final report on local demonstration experiments	Dec. 1988		
3. Projection of Project Completion Date			
~~Transformer rinsing~~/ Soil decontamination	12/87 12/88		
4. Project Final Report			
~~Transformer rinsing~~/ Soil decontamination	12/87 12/88		
5. Presentations to R&D Committee			
~~Transformer rinsing~~			
~~Mid-Project~~ --	Sept. 1987		
~~Final Project~~ --	Jan. 1988		
Soil decontamination			
Mid-Project	Jan. 1988		
Final Project	Jan. 1989		

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